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Winchell.

Coelosoridae Chiocneis

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Geol. & Nat. Hist. Survey of Minnesota Eighth An. Rep. For 1879 (printed 1880)

APPENDIX D.

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CASTOROIDES OHIOENSIS, *Foster.*

BY N. H. WINCHELL.

In the city of Minneapolis, while digging for a cistern on the corner of Washington avenue and Fifteenth avenue north, Mr. — Sommers discovered, at the depth of eight feet, the left mandibular ramus of this rare beaver-like rodent. The position is within the Valley of the Mississippi River, and under the sandy loam that lies on the brick clay. Referring to the diagram opposite page 168 of the report for 1876 (fifth report), its position is illustrated. It lay near the bottom of the "sandy, loam-covered, gravelly plain," about twenty feet above the river, and over the brick clay, so near the brick clay that in excavating in search for other pieces, some of the clay was thrown out. Accompanying it were fragments of *Unio* shells. It hence belongs to that period of time when the Mississippi extended between the high drift bluffs that enclose the city of Minneapolis, and which are about two miles apart, and hence to the flood, or "terrace," epoch, of the glacial period. Probably the ice of the glacial period still prevailed over the northern part of the State, its dissolution supplying the abundant water which kept the Mississippi at that stage.

This rodent was first found in the State of Ohio, at Nashport, Licking County, and was described anonymously, but not named, by J. W. Foster, in the American Journal of Science and Arts for 1837, with figures, and subsequently named by him in the 2d Report on the Geology of Ohio, in 1838. It was again found at Clyde, Wayne County, New York, and was described and figured by Wyman in the Proceedings of the Boston Society of Natural History, in 1846. This discovery embraced the right ramus and the entire skull. In the University Museum are perfect plaster casts of these specimens, the original of which are in the museum of Geneva College. The remains of the same animal (ramus of the lower jaw) have been found also at Memphis, Tenn., which were described by Wyman in the Am. Jour. Sci. and Arts for 1850, vol. X, and in the third volume of the Proc. Bos. Soc. (1850); also by Agassiz in Proc. Am. Assc. Adv. Sci. for 1851. Mr. J. Le Conte records its discovery at Shawneetown, Illinois, in the Proc. Phil. Acad. Nat. Sci., vol. VI , p. 53, and J. Leidy notes fragments of teeth from the Ashley River, South Carolina, and a skull near Charleston, Coles County, Ill. Wyman also mentions its discovery near Natchez, Mississippi, and in Louisiana, and A. Winchell records it in Michigan, in the American Naturalist for 1870. J. A. Allen reports it from Dallas, Dallas County, Texas, from the alluvial deposits of the Trinity River, associated with the

remains of an extinct horse and mastodon, in the Monograph on Rodentia (vol. XI) of the United States Geological Survey of the Territories, by F. V. Hayden. It seems, therefore, to have been extended over the whole of the United States east of the Mississippi from Minnesota to Louisiana, and into Texas, and to have been cotemporary with the mastodon, and hence with the mound builders. It was, however, quite different from the living beaver, and may not have been acquatic. No portions of the skeleton except the head and teeth have been discovered. Its size was about that of the common black bear, according to Mr. Allen, and it was wholly a vegetarian.

The specimens found at Minneapolis consist of the left ramus and the lower left incisor, the latter evidently broken from the former in being removed from the sand in which the whole was entombed. Their size indicates an animal somewhat larger than the specimen first found in Ohio and described by Foster, and also larger than that found in New York. It is, however, a little smaller than that described by Wyman from Memphis. The whole length of the specimen, when the parts are united, is 9½ inches, of which 5¼ inches consist of the projecting, uncovered incisor, a portion of the jaw being broken away on the under side. The condyle and coronoid process are wanting, and the sigmoid notch is also gone. On the under portion of the mandible the alveolar cavity of the incisor is broken into between the symphysis and the angular (?) process, disclosing the dark-brown enamel of the incisor. The angular process is about half an inch in length, directed obliquely inward and backward Its base extends antero-posteriorly an inch and a half. Its shape is that of a blunt rounded wedge, and its under surface is in a plane at right angles to the grinding surface of the molars. The four molars are all preserved perfectly. The first one, which rises a little more than half an inch in front, above the alveolar cavity, has four, obliquely transverse lamellæ, or flattened hollow plates, covered with enamel and cemented together, one after the other, by layers of *crusta petrosa*, which also seems to fill their interior. Within the alveolar cavity these plates, or sacks, at least in the fourth molar, are separate and free, and when this tooth is taken out their lower ends are open. The outer surfaces are finely striated perpendicularly, and crossed transversely by undulations of growth. The second and third molars have each three lamellæ, the first and last of which are obliquely transverse but parallel, while the second is more obliquely transverse and longer, nearly touching the interior angle of the third and the exterior angle of the first. The lamellæ all cross the mandible from within obliquely outward and forward. The second and third molars are of nearly the same size and shape, but they rise less above the alveolar cavity. They are sunk deep within the mandible, along the outside of the incisor. The enamel ridges on the grinding surfaces form a broad letter S. In the fourth molar the dentinal plates are three in number and more nearly parallel, and less oblique to the general direction of the grinding surface. These plates terminate on the upper surface of the incisor, which passes below, or along the inside of the bases of all of the molars. The symphysis of the mandible, where it united with the other ramus, is three inches long, there being a thickening of the bone and a downward process on the under side of the ramus where the incisor in use would most need a powerful fulcrum. The greatest diameter of the incisor, where broken, is one inch.

Its section is sub-triangular, the outer and lower surfaces being rounded, while the upper and inner surfaces are flat or slightly concave. The exterior curved surface is grooved longitudinally, with 18-20 grooves, which are about twice as wide as the ridges they separate. They are unequally distant, being more close on the lower side than on the outside. The inside and upper side are not thus grooved, but they show fine transverse waving undulations of growth, which also are sometimes visible crossing the grooves and ridges of the exterior surface. At the extremity, which seems to have run nearly to a point (now broken off) rather than to an edge, the enamel is worn away by use on the upper side about an inch from the end. There is a large duct or canal entering the ramus about an inch back of and above the fourth molar, which, passing the fourth molar without bifurcation, descends obliquely over the incisor outwardly, and passes below the third molar. The grinding surface of the molars is concave in the direction of its length, as in other specimens that have been described. Its length is three inches. Our specimen thus compares with others in the length of the grinding surface of the molars:

The Clyde specimen	2.7½	inches.
The Nashport specimen	2.8	"
The Memphis specimen	3.1	"
The Minneapolis specimen	3.0	"

Prof. A. J. Allen regards the Castoroides so constituting the type of a distinct and hitherto unrecognized family (*Castoroididæ*) and separates it entirely from the *Castoridæ*. In the same group he inclines to include the Amblyrhiza and Loxomylus, described by Prof. Cope, from the bone caverns of Anguilla Island, West Indies. This rodent, he says, "presents a singular combination of characters, allying it, on the one hand, to the beaver, and on the other, to the chinchillas and viscachas, and also to the muskrat, but which at the same time separate it widely from either group."

CASTOROIDES OHIOENSIS, Foster.

A. View of the fourth Molar from below.
B. Side view of the fourth Molar.
C. Section of the left Incisor.
D. Grinding surface of the Molars.
E. The left Ramus.

E

A

C

B

D

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